

Management of Bureaucrats and Public Service Delivery:
Evidence from the Nigerian Civil Service

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Motivation

- the effectiveness of a government bureaucracy matters
 - from a macro perspective:
 - large share of total economic activity [25-35% of GDP in LDCs]
 - quality of the bureaucracy is an important driver of growth, welfare and equality
 - from a micro perspective:
 - presumption behind many program evaluations is that successful ones can be scaled-up and delivered by government
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Filling the Evidence Gap

- despite the importance of government effectiveness for citizen welfare:
 - **public administration** literature is devoid of good evidence linking practices in civil service organizations to public good outcomes [Goldfinch et al. 2012]
 - **economic** analyses of incentives in the public sector have largely focused on:
 - selection/motivation of **politicians**
 - response to incentives of **frontline** staff (teachers/health workers)
 - little evidence linking the managerial practices that the vital middle-tier of **bureaucrats** operate under, to public services delivered
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Challenges for Understanding Public Service Delivery in LDCs

- Banerjee *et al.* [2007] suggest two constraints restricting the supply of evidence on public service provision:
 - the process of project implementation is almost never directly quantifiable
 - differences in the quality of public goods are difficult to measure
 - this paper makes progress on both measurement issues...
 - ...and measurement issues related to:
 - project complexity [engineering assessments]
 - management practices [BVR style survey]
 - bureaucrat characteristics [survey fielded to 4100 bureaucrats]
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Management Matters

- measure management practices bureaucrats operate under following Nick Bloom and John Van Reenen's approach
 - adapt their management surveys to our setting, account for insights from public administration [Rose-Ackerman 1986, Wilson 1989]
 - for each civil service organization, we derive three indices of management practices:
 - provision of **autonomy/flexibility** to bureaucrats
 - provision of performance-based **incentives** and **monitoring** to bureaucrats
 - composite index of other practices (staff training, culture etc.)
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Why Autonomy?

- autonomy long emphasized in public administration literature:
 - full delegation: rely on bureaucrats professionalism and resolve to deliver public services [Simon 1983]
 - Weberian view: *misalignment of objectives* of bureaucracies and society implies entirely rules-based system ensures consistent and acceptable levels of public service delivery
 - in organizational economics, despite its early prominence [Simon 1951, Harsanyi 1978], field evidence of the impact of autonomy on performance is scarce
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Why Performance-based Incentives?

- vast contract theory literature emphasizing key trade-off between **monetary incentives** and risk
 - body of evidence suggesting monetary incentives in private sector settings are effective
 - current 'good governance agenda' emphasizes use of performance pay for bureaucrats
 - however evidence from (frontline) public sector is mixed:
 - positive [Glewwe et al. 2010, Muralidharan and Sundararaman 2011...]
 - zero/negative: Perry et al. [2009], Fryer [2013], two CRs in health...
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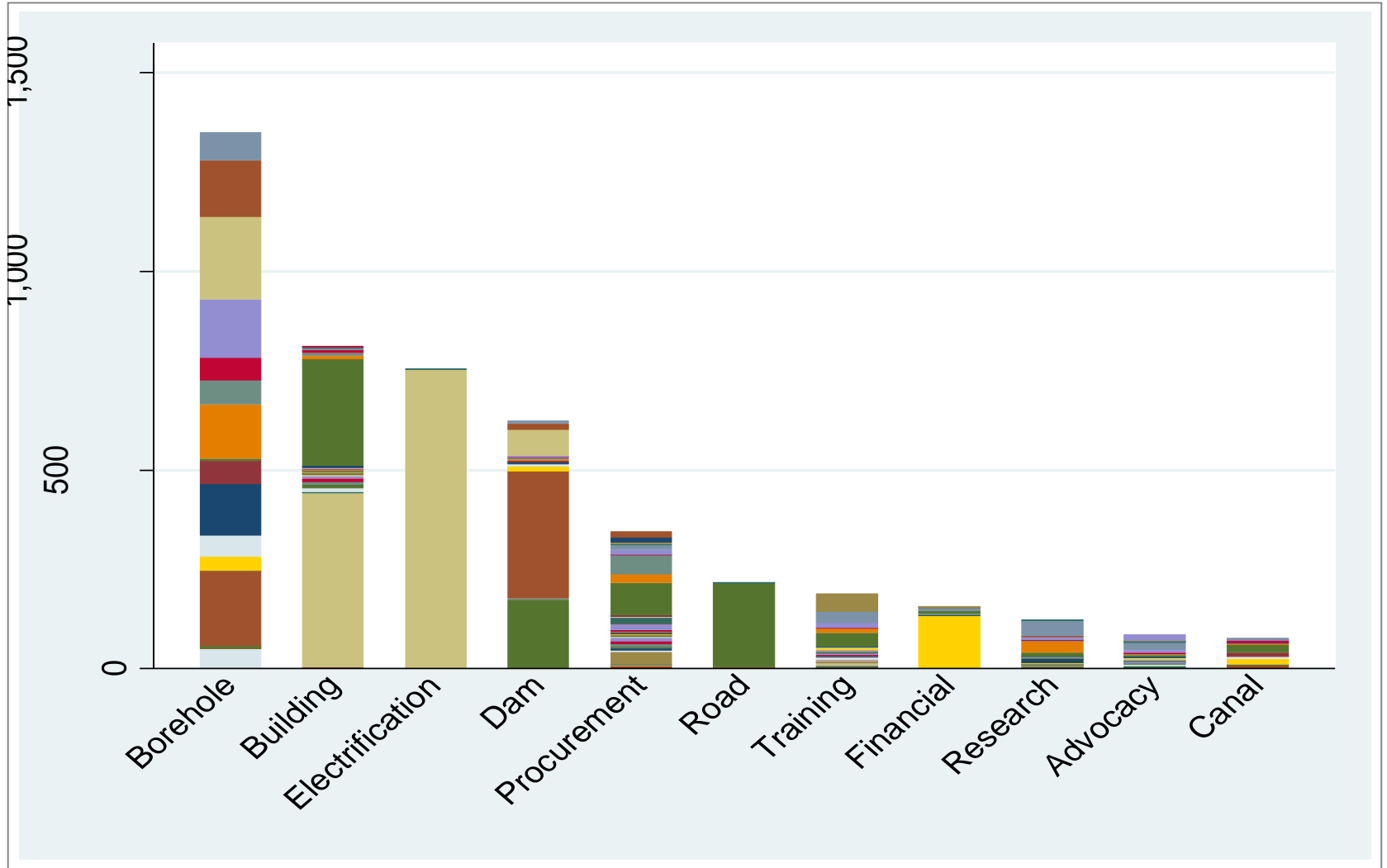
Institutional Background

- Nigeria is home to 160mn individuals, 20% of the population of SSA
 - government expenditures correspond to 26% of GDP
 - British colonial legacy: civil service structures
 - ministries are the central coordinating authority [data: 10 ministries + 53 other federal civil service orgs]
 - Minister → Permanent Secretary → bureaucrats
 - bureaucratic appointments made centrally (Head of the Civil Service)
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Projects

- projects assigned to organizations are decided centrally by the National Assembly
 - 11 project types (road, borehole, training etc.) [construction vs. non-construction]
 - same project type implemented by **multiple** organizations
 - e.g. small-scale dams are constructed by the federal ministries of water, agriculture, and environment, and by all of the river basin development authorities
 - each organization implementing **multiple** project types
 - identify impact of management practices on public service delivery within project type
 - [Figure A]
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Figure A: Major Project Types by Implementing Organization



Notes: Each histogram bar represents the total number of projects for the given project type on the x-axis. Each colored band represents the projects at a particular organization (different bands imply different organizations irrespective of whether they are the same color). The sample used to construct the histogram is those projects for which proportion completed evaluation variable and management scores are available. The projects are classified here by their primary classification.

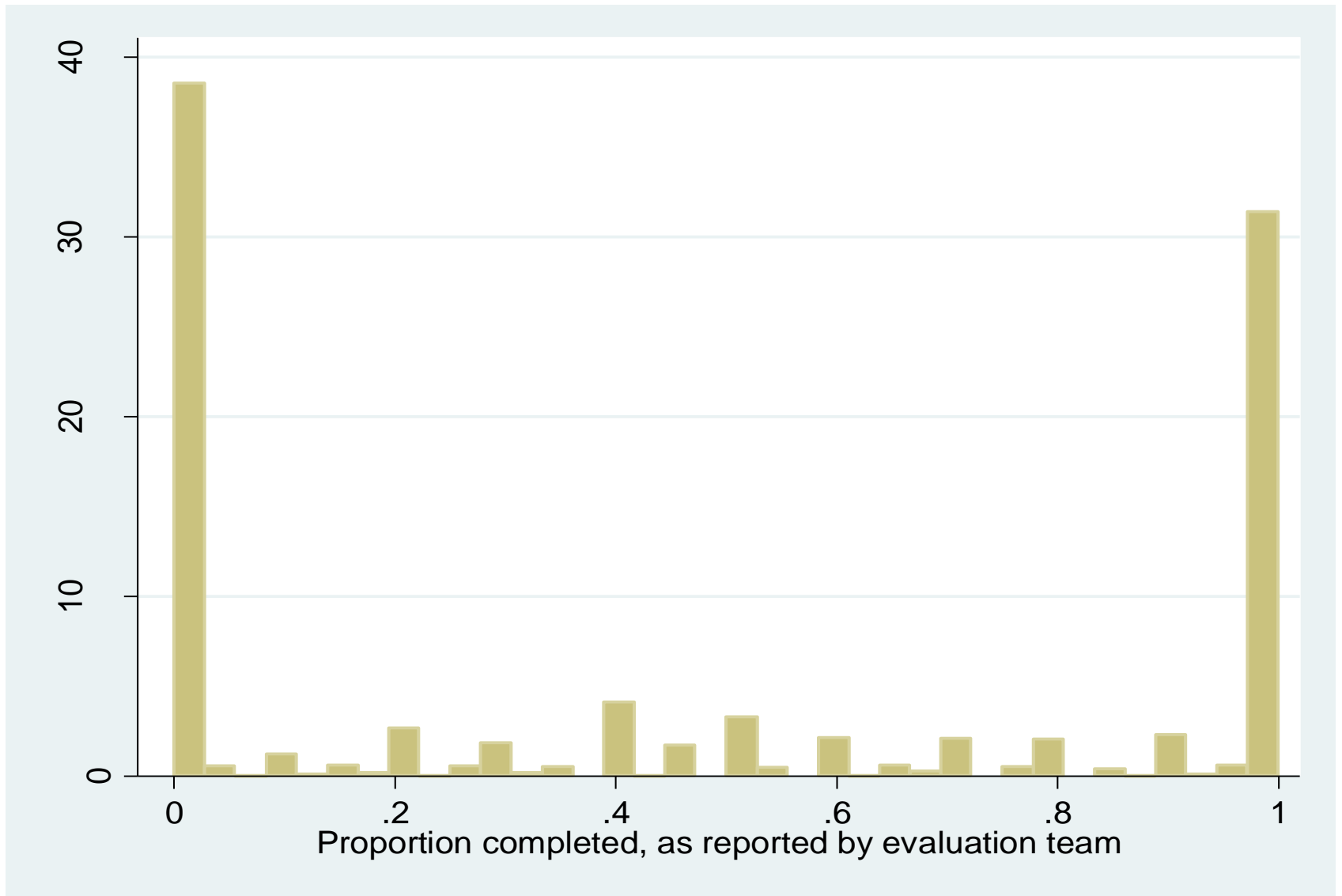
The OPEN Initiative

- Nigerian government began a program of sweeping reforms in 2003 [Nkonjoleala and Osafo 2007]
 - as a result, Paris Club canceled its external debt to the tune of US\$18bn
 - Presidency saw this as an opportunity to track the effectiveness of government expenditures
 - 2006/7 started the OPEN initiative: to trace, by project, the use and impact of 10% of all Federal Government social sector expenditures
 - we focus on projects with a 12 month completion schedule
 - projects evaluated by **independent** teams of engineers for their completion rate [0-1] and quality {0,1}
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Checks and Balances in OPEN

- centralized team of technocrats monitored the evaluation teams, providing them with training and opportunities for standardization of their methods
 - evaluators were asked to provide material, photographic, or video evidence to support their reports
 - the national teams and Presidency performed random checks on evaluated sites (all of which were found to be consistent with OPEN monitors)
 - Dan hand coded the material from all projects recorded in OPEN initiative reports from 63 organizations:
 - 4721 projects, aggregate budget of US\$800 million
 - [Figure B; Tables 1, 2]
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Figure B: Proportion Projects Completed



Notes: This is a histogram of the proportion of project completed variable. The sample used to construct the histogram is those projects for which proportion completed evaluation variable and management scores are available.

Table 1: Descriptive Evidence on Project Types

Project Type	(1) Number of Projects [Proportion]	(2) Number of Implementing Organizations	(3) Median Budget Allocation (US\$000s)	(4) Proportion Never Started	(6) Proportion Completed Conditional on Being Started	(7) Proportion Fully Completed	(8) Proportion With Satisfactory Quality
Borehole	1348 [0.29]	18	29	0.44	0.84	0.37	0.85
Building	806 [0.17]	32	120	0.37	0.79	0.34	0.81
Electrification	751 [0.16]	2	93	0.14	0.65	0.25	0.87
Dam	624 [0.13]	14	18	0.79	0.74	0.10	0.50
Procurement	345 [0.07]	41	87	0.30	0.83	0.47	0.85
Road	217 [0.05]	4	167	0.12	0.59	0.22	0.79
Training	189 [0.04]	26	80	0.20	0.74	0.42	0.84
Financial project	157 [0.03]	8	17	0.38	0.79	0.35	0.84
Research	122 [0.03]	21	67	0.11	0.72	0.52	0.99
Advocacy	86 [0.02]	23	49	0.24	0.80	0.47	0.94
Canal	76 [0.02]	12	347	0.70	0.45	0.05	0.92

Notes: The “project type” classification refers to the primary classification for each project. Other project classifications exist. The median budget allocation in Column 3 is in thousands of US Dollar (assuming an exchange rate of US\$1: Naira 150). The sample of projects covers those which have a positive budget allocation and for which the proportion completed evaluation variable and management scores are available. The project quality variable in Column 8 is not available for all projects. Standard deviations are in parentheses. Figures are rounded to two decimal places where relevant.

Table 2: Descriptive Evidence on Largest Civil Service Implementing Organizations

Civil Service Organization	(1) Number of Projects	(2) Number of Unique Project Types	(4) Proportion Never Started	(5) Proportion Completed	(6) Proportion Completed Conditional on Being Started
Federal Ministry of Agriculture and Rural Development	797	9	0.54	0.29	0.63
Federal Ministry of Power and Steel	750	1	0.14	0.56	0.25
Federal Ministry of Water Resources	520	4	0.95	0.04	0.77
National Primary Health Care Development	447	4	0.19	0.64	0.79
Sokoto Rima River Basin Development Authority	277	2	0.22	0.66	0.85
Upper Benue River Basin Development Authority	169	3	0.11	0.89	1.00
Ogun/Oshun River Basin Development Authority	165	4	0.55	0.32	0.71
Chad Basin River Basin Development Authority	148	3	0.43	0.56	1.00
Lower Benue River Basin Development Authority	143	3	0.45	0.42	0.77
Nigerian Agricultural Cooperative and Rural Development Bank	133	2	0.42	0.46	0.80

Notes: The sample covers the ten largest civil service organizations ranked by number of projects from our overall sample of projects. The “project type” classification refers to the primary classification for each project. Other project classifications exist. The budget allocation in Column 3 is in millions of US Dollars (assuming an exchange rate of US\$1: Naira 150). The sample of projects covers those which have a positive budget allocation and for which the proportion completed evaluation variable and management scores are available. The project quality variable in Column 8 is not available for all projects. Standard deviations are in parentheses. Figures are rounded to two decimal places where relevant.

Management Practices

- revival of research investigating the impacts of management practices on productivity and performance of private sector firms
 - follow BVR's methodology to measure management practices in civil service organizations
 - adapt their survey tool and practices to the Nigerian public sector setting
 - derive three measures of management practice: CS-autonomy, CS-performance, CS-other
 - construct z-score for each management practice
 - [Tables A3]
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Table A2: Defining Management Practices Using the CS Indices

Management Practice	Topic	Specific Questions Related to this Topic
CS-Autonomy	Roles	Can most staff above SGL 7 in your organization make substantive contributions to the policy formulation and implementation process?
		Can most staff above SGL 15 in your organization make substantive contributions to the policy formulation and implementation process?
		To what extent do the employees in this organization have the ability to determine how they carry out the assignments in their daily work?
	Flexibility	Does your organization make efforts to redefine its standard procedures in response to the specific needs and peculiarities of a community?
		How flexible would you say your organization is in terms of responding to new practices, new techniques, and regulations?
		At your organization, how efficiently is best practice shared between departments?
		Given past experience, how effectively would a conflict within your organization be dealt with?

Table A2: Defining Management Practices Using the CS Indices

Management Practice	Topic	Specific Questions Related to this Topic
CS-Performance	Incentives	Given past experience, how would under-performance be tolerated?
		Given past experience, what happens if there is a part of your organization that isn't achieving agreed results?
		What percentage of <i>workers</i> were rewarded when targets were met?
		What percentage of <i>managers/directors</i> were rewarded when targets were met?
		Given past experience, are members of this organization disciplined for breaking the Public Service Rules?
		Given past experience, what would most likely happen to a person in this organization who accepted money or a present from someone who came to them with a problem?
	Monitoring	In what kind of ways does your organization track how well it is delivering services?
		If have performance indicators, how often are these indicators collected?
		If have performance indicators, how often are these indicators reviewed by Minister or Permanent Secretary?
		If have performance indicators, how often are these indicators reviewed by non managerial staff?
		Does the organization use performance or quality indicators for tracking the performance of its employees?
		At your organization, how highly regarded is the collection and use of data in planning and implementing projects?

Variation in Management Practices Across Organizations

- management scores are *positively* correlated with each other → *not* the case that the provision of autonomy and performance incentives are substitutes
 - not so highly correlated that we cannot measure the impacts of both separately
 - **note:** labor market rigidities for bureaucrats
 - initial postings are centrally decided
 - long tenure, little mobility across organizations
 - implies weakened impact of management practices to endogenously attract bureaucrats
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What Determines Management Practices?

- semi-structured interviews in four organizations to better understand how management practices evolve
 - Public Service Rules of the Nigerian Civil Service → history of management staff → external events
 - emphasis is on slow moving changes
 - not driven by CEO of organization: distinct from managerial style [Bertrand and Schoar 2003]
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Other Variables

- identification is within project type: important to condition on project complexity
 - collaborated with a pair of Nigerian engineers familiar with OPEN projects
 - complexity indicators constructed from OPEN technical reports, following engineering practice [Remington and Pollack 2007]
 - cover aspects of design and implementation ambiguities [key distinction between goods provided by public and private sectors?]
 - multiple checks put in place to validate complexity measures
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Baseline Results: Project Completion Rates

- CS-autonomy has robust **positive** impact on project completion rates
 - CS-performance has robust **negative** impact on project completion rates
 - recall the underlying management practices are positively correlated to each other ($\rho = .24$)
 - effect sizes: CS-autonomy 18%; CS-performance 14%
 - backdrop: 38% of projects never started; 31% fully completed
 - [Table 3, Cols 1-4]
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Table 3: Management Practices and Public Sector Service Delivery

Standard Errors: Clustered by Project Type Within Organization

OLS Estimates

Project Completion Rates

	(1) Unconditional	(2) Organization Controls	(3) Project Controls	(4) Project Type Fixed Effects	(5) Interaction
CS-Autonomy	0.11** (0.05)	0.18*** (0.03)	0.17*** (0.03)	0.18*** (0.03)	0.23*** (0.03)
CS-Performance	-0.06* (0.03)	-0.11*** (0.02)	-0.11*** (0.02)	-0.14*** (0.02)	-0.15*** (0.02)
CS-Other	0.10*** (0.04)	0.05 (0.03)	0.05 (0.03)	0.08*** (0.02)	0.08*** (0.02)
CS-Autonomy x CS-Performance					0.06** (0.02)
Organization Controls (capital, general, noise)	No	Yes	Yes	Yes	Yes
Project Controls	No	No	Yes	Yes	Yes
Fixed Effects	None	None	None	Project Type	Project Type
Observations (clusters)	4721 (201)	4721 (201)	4721 (201)	4721 (201)	4721 (201)

Notes: *** denotes significance at 1%, ** at 5%, and * at 10% level. Standard errors are in parentheses, and are clustered by project type within organization throughout. All columns report OLS estimates. The dependent variable in Columns 1 to 6 is the proportion of the project completed (that is a continuous measure between zero and one). The dependent variable in Column 7 is a dummy variable that takes the value one if project quality is reported as satisfactory or higher, and zero otherwise. The dependent variable in Columns 8 and 9 is a product of the proportion completed variable and the dummy variable for quality. The sample of projects in Columns 6 to 9 is limited to those for which project completion and quality data is available. Project Type fixed effects relate to whether the primary classification of the project is as a financial, training, advocacy, procurement, research, electrification, borehole, dam, building, canal or road project. Project controls comprise project-level controls for the project budget, whether the project is new or a rehabilitation, and an assessment of its aggregate complexity by Nigerian engineers. Capital controls comprise organization-level controls for the logs of number of employees, total budget, and capital budget. General controls comprise organization-level controls for the share of the workforce with degrees, and the share of the workforce with postgraduate qualifications. Noise controls are four interviewer dummies, indicators of the seniority, gender, and tenure of the managers who responded, the day of the week the interview was conducted, the time of day the interview was conducted, a dummy variable indicating whether the interview was conducted during Ramadan, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer. Note that no quality information is available for organizations surveyed on a Saturday, and thus the dummy variable indicating a survey took place on a Saturday is omitted in Columns 7, 8 and 9. Total and capital budget figures are an average of organization budget figures for the years 2006-10. Figures are rounded to two decimal places.

Interpretation

- autonomy: divesting authority/flexibility to bureaucrats is a good thing, against Weberian view
 - performance pay: negative impact on average, contrary to good governance agenda
 - multiple explanations of why performance incentives can have negative impacts on output:
 - project characteristics: complexity/multi-tasking [Holmstrom and Milgrom 1991]
 - bureaucrat characteristics: motivated agents etc.
 - [Table 4, Cols 1-2]
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Table 4: Heterogeneous Impacts of Management Practices Related to Performance-Based Incentives

Dependent Variable: Project Completion Rate
 Standard Errors: Clustered by Project Type Within Organization
 Interactions in Deviation from Mean in Column 1
 OLS Estimates

	(1) Project Complexity	(2) Non-modal Project
CS-Autonomy	0.19*** (0.03)	0.19*** (0.03)
CS-Performance	-0.16*** (0.03)	-0.13*** (0.03)
CS-Other	0.08*** (0.02)	0.08*** (0.02)
CS-Performance x Project Complexity	-0.19*** (0.06)	
CS-Performance x Non-modal Project Type		-0.05* (0.03)
Project Complexity	-0.01 (0.11)	0.05 (0.12)
Project of Non-modal Type for Organization		-0.04 (0.03)
Organization Controls (capital, general, noise)	Yes	Yes
Project Controls	Yes	Yes
Fixed Effects	Project Type	Project Type
Observations	4721 (201)	4721 (201)

Bureaucrat Characteristics

- **tenure:** bureaucrats enjoy long tenure, might be better able to exploit flexibilities to act on performance incentives, or become gradually demotivated by constant monitoring
 - **intrinsic motivation:** performance incentives might crowd out intrinsic motivation of workers attracted to the public sector [Rose-Ackerman 1986, Perry and Wise 1990, Benabou and Tirole 2006]
 - perceptions of organizational **corruption:** performance-based incentives counteract corrupt motives?
 - measure bureaucrat characteristics using the survey we administered to a representative sample of officials at each organization
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Measuring Intrinsic Motivation

- we asked bureaucrats what had most influenced them to originally enter the civil service: 'I was interested in the type of work', 'income prospects', 'the prestige associated with such a job', 'the stable career path that a job in the service affords', 'the chance to serve Nigeria', 'it was the only employment I could get', 'educational opportunities', 'other'
 - use the proportion of staff that answered 'the chance to serve Nigeria' as a measure of the intrinsic motivation within the organization
 - around 33% of officials defined as intrinsically motivated
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Measuring Perceptions of Corruption

- Nigeria is one of the most corrupt countries in the world [recall 38% of projects are never started]
 - we asked on what proportion of recent projects the official had worked on did they observe 'others breaking service rules for their own benefit'
 - on average, officials stated that on 38% of projects such observations of corrupt practice had been made
 - quantitatively large direct negative impact on project completion rates
 - [Table 4, Cols 3-5]
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Table 4: Heterogeneous Impacts of Management Practices Related to Performance-Based Incentives

Dependent Variable: Project Completion Rate

Standard Errors: Clustered by Project Type Within Organization

Interactions in Deviation from Mean

OLS Estimates

	(3) Tenure	(4) Intrinsic Motivation	(5) Observe Corrupt Practices
CS-Autonomy	0.20*** (0.03)	0.21*** (0.03)	0.16*** (0.03)
CS-Performance	-0.11*** (0.03)	-0.17*** (0.03)	-0.17*** (0.03)
CS-Other	0.06** (0.03)	0.07*** (0.02)	0.07*** (0.03)
CS-Performance x Average Tenure of Bureaucrats	-0.02*** (0.004)		
CS-Performance x Proportion of Bureaucrats Intrinsically Motivated		0.54** (0.22)	
CS-Performance x Proportion of Projects that Bureaucrats That Report Observing Corrupt Practices			0.25 (0.28)
Average Tenure of Bureaucrats	-0.01 (0.01)		
Proportion of Bureaucrats Intrinsically Motivated		-0.47 (0.33)	
Proportion of Projects that Bureaucrats That Report Observing Corrupt Practices			-1.09*** (0.37)
Organization Controls (capital, general, noise)	Yes	Yes	Yes
Project Controls	Yes	Yes	Yes
Fixed Effects	Project Type	Project Type	Project Type
Observations	4721 (201)	4721 (201)	4721 (201)

Econometric Concerns

- opposite signed impacts on project completion rates of management practices related to autonomy and performance-incentives
 - this despite the two management practices being positively correlated to each other
 - to underpin a causal interpretation of our results we address concerns related to:
 - non-random assignment of projects to organizations based on management
 - unobservables: bureaucrats (sorting); organizations (resources); other management practices
 - endogeneity: do impacts vary with relative importance of projects in the total portfolio of activities of organizations?
 - [Tables A6-A11]
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Contributions

- among the first widescale evidence in public management and organizational economics literatures to link practices in civil service organizations to public services delivered
 - management practices matter
 - one sd adjustments in CS-autonomy and CS-performance → 32% increase in project implementation rates
 - 38% of projects not started
 - \$1.4bn total value of not-started projects across 63 organizations
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Why Are Organizations Not Optimizing?

- Weberian view: agency problems cause divergence between objectives of society and bureaucracies [objective \neq max completion rates]
 - the fixed costs of adopting better practices? \approx \$7.13mn per org.
 - best management practices might be heterogeneous across organizations
 - learning and adjustment costs might cause best practice to diffuse over time
 - lack of competition/price signals between public agencies
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Wider Future Agenda: Improving Public Service Delivery

- this paper: management practices for bureaucrats **within** public sector
- interplay with other channels documented to raise public service delivery:
 - selection of workers **into** public sector [Dal Bo et al. 2013 use experimental variation in wage offers]
 - public accountability/top-down auditing [Besley and Burgess 2002, media; Olken 2007, roads]
 - grassroots monitoring [Bjorkman and Svensson 2010, health]
 - provision of information to users [Reinikka and Svensson 2011, health; Andrabi et al. 2013, education]
- rich agenda to study these multiple margins together